GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA

UNSTARRED QUESTION NO:1954
ANSWERED ON:09.03.2016
Shortage of Atomic Fuel
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Will the Minister of ATOMIC ENERGY be pleased to state:

(a)whether some of our country''s nuclear power plants are facing shortage of imported fuel/uranium;

(b)if so, the details thereof and the reasons therefor along with the action taken/being taken by the Government in this regard;

(c) whether the Government proposes to explore an alternative fuel or technology for generation of nuclear power and if so, the details thereof;

(d) the steps taken/being taken by the Government in this regard; and

(e) whether nuclear power plants accounts for only 3.5% of India''s current electricity generation and its share in India''s future electricity generation will be less than 10% even if the installed capacity is tripled and if so, the reaction of the Government thereto?

Answer

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (Dr. JITENDRA SINGH):

(a) No, Sir. Nuclear power plants in the country are presently operating at the rated capacity.

(b) Does not arise in view of (a) above.

(c) India has large deposits of thorium, which can be used to generate nuclear power. However, it is not possible to build a nuclear reactor using thorium alone due to its physics characteristics. Thorium has to be converted to Uranium-233 in a reactor before it can be used as fuel. With this in view, a three-stage nuclear power programme, based on a closed nuclear fuel cycle has been chalked out to use thorium as a viable and sustainable option, The three stage nuclear power programme aims to multiply the domestically available fissile resource through the use of natural uranium in Pressurised Heavy Water Reactors (PHWRs), followed by use of plutonium obtained from the spent fuel of Pressurised Heavy Water Reactors (PHWR) in Fast Breeder Reactors (FBR). Large scale use of Thorium will subsequently follow making use of Uranium-233 that will be bred in Fast Breeder Reactors, when adequate nuclear installed capacity in the country has been achieved. The third stage of Indian nuclear power programme which contemplates making use of Uranium-233 to fuel Uranium-233 − Thorium based reactors, can provide energy independence to the country for several centuries. Technology development and demonstration activities are continuing, so that a mature technology is available in time.

(d)Bhabha Atomic Research Centre (BARC) and other research organisations attached with Department of Atomic Energy (DAE) are engaged in various R&D activities to address the utilisation of thorium in different types of reactors. Some important highlights of these activities are:

i.Thorium Oxide (Thoria) pellets contained in bundles have been used in the initial cores of our Pressurised Heavy Water Reactors (PHWRs). Thoria based fuels have also been irradiated in the research reactors CIRUS and Dhruva. After such irradiations, these fuel elements have been examined in the laboratories at Bhabha Atomic Research Centre (BARC), and the results are satisfactory.

ii.The irradiated thoria pins of CIRUS have been reprocessed to obtain Uranium-233. The recovered Uranium-233 has been fabricated as fuel for the 30 kW (thermal) KAMINI reactor, which is in operation at Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam.

iii.A 300 MW Advanced Heavy Water Reactor (AHWR) using thorium based fuel has been designed and developed. This reactor will serve as a technology demonstrator for not only the thorium fuel cycle technologies, but also several advanced passive safety features. iv. A Critical Facility for Advanced Heavy Water Reactor was commissioned in 2008 at BARC, and is used for carrying out experiments to further validate the physics design features of AHWR.

(e)The present nuclear power capacity is 5780 MW and the nuclear power share in current electricity generation in the country (April 2015 to January 2016) is about 3.3%. The exact share on tripling of the nuclear power capacity would depend on the electricity generation from all other sources at that time.

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